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Original Investigation

On the Outskirts of National Health Reform: A Comparative Assessment of Health Insurance and Access to Care in Puerto Rico and the United States

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Policy Points:

- Puerto Rico is the United States' largest territory, home to nearly 4 million American citizens, yet it has remained largely on the outskirts of US health policy, including the Affordable Care Act (ACA).
- We analyzed national survey data from 2011 to 2012 and found that despite its far poorer population, Puerto Rico outperforms the mainland United States on several measures of health care coverage and access to care.
- While the ACA significantly increases federal resources in Puerto Rico, ongoing federal restrictions on Medicaid funding and premium tax credits in Puerto Rico pose substantial health policy challenges in the territory.

Context: Puerto Rico is the United States' largest territory, home to nearly 4 million American citizens. Yet it has remained largely on the outskirts of US health policy, including the Affordable Care Act (ACA). This article presents an overview of Puerto Rico's health care system and a comparative analysis of coverage and access to care in Puerto Rico and the mainland United States.

Methods: We analyzed 2011-2012 data from the Behavioral Risk Factor Surveillance System, and 2012 data from the American Community Survey and its counterpart, the Puerto Rico Community Survey. Among adults 18 and older, we examined health insurance coverage; access measures, such as having a usual source of care and cost-related delays in care; self-reported health; and

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the receipt of recommended preventive services, such as cancer screening and glucose testing. We used multivariate regression models to compare Puerto Rico and the mainland United States, adjusted for age, income, race/ethnicity, and other demographic variables.

Findings: Uninsured rates were significantly lower in Puerto Rico (unadjusted 7.4% versus 15.0%, adjusted difference: −12.0%, $p < 0.001$). Medicaid was far more common in Puerto Rico. Puerto Rican residents were more likely than those in the mainland United States to have a usual source of care and to have had a checkup within the past year, and fewer experienced cost-related delays in care. Screening rates for diabetes, mammograms, and Pap smears were comparable or better in Puerto Rico, while colonoscopy rates were lower. Self-reported health was slightly worse, but obesity and smoking rates were lower.

Conclusions: Despite its far poorer population, Puerto Rico outperforms the mainland United States on several measures of coverage and access. Congressional policies capping federal Medicaid funds to the territory, however, have contributed to major budgetary challenges. While the ACA has significantly increased federal resources in Puerto Rico, ongoing restrictions on Medicaid funding and premium tax credits are posing substantial health policy challenges in the territory.

Keywords: Puerto Rico, access to care, health insurance, health reform.

The Commonwealth of Puerto Rico is home to 3.6 million residents, 97% of them US citizens, a population larger than that of approximately 20 states in the United States.[1] In addition, more than 4.7 million Americans living in the 50 states are of Puerto Rican origin, and tens of thousands of people move back and forth annually between the territory and the mainland United States.[2] Even so, this large group of citizens has generally been an afterthought in American health policy, particularly in light of the major changes implemented under the Affordable Care Act (ACA). This article presents an overview of Puerto Rico's health system and a new analysis of recent health care data, with a focus on health insurance coverage and access to care. Our objective was to provide insights into potential areas for federal policies to improve health care for the millions of American citizens living in Puerto Rico, as well as to identify lessons that Puerto Rico's own health policy experiences may offer the mainland United States.

Political and Economic Overview

In land area and population, Puerto Rico is the largest of the 5 US territories. It was acquired by the United States in 1898 during the Spanish-American War, and Puerto Ricans born on the island have been recognized as US citizens since the Jones Act of 1917. As a US territory, Puerto Rico is subject to US federal laws, although it has its own constitution. Besides the 3.6 million Puerto Ricans living on the island, more than 4.7 million Latinos of Puerto Rican origin live in the mainland United States.[1,2] There also are approximately 100,000 foreign residents on the island, roughly two-thirds of whom are unauthorized immigrants.[3] The rights of Puerto Ricans residing on the island are different from those of Puerto Ricans who reside on the mainland. For example, island Puerto Rican residents are allowed to vote in the primaries for US presidential candidates but not in the national elections and, as discussed later, often face significant limitations on their eligibility for public services available in the mainland United States. Conversely, Puerto Rican residents on the mainland are entitled to full voting rights in all US elections as well as eligibility for public programs and subsidies, the same as any other US citizen. In Congress, Puerto Ricans have a resident commissioner who advocates for the territory's constituents but is not allowed to vote.

Economic conditions in Puerto Rico are worse than those in any state in the United States. For instance, in 2012, the poverty rate in Puerto Rico was over 45%, more than twice the level of Mississippi, the poorest state in the mainland United States.[4] Also in 2012, Puerto Rico's per capita income was slightly over $19,000 compared with $50,000 in the mainland United States.[5] Income inequality in Puerto Rico also is a significant issue, with a Gini coefficient that exceeds all 50 states and the District of Columbia.[5]

Overview of Puerto Rico's Health Care System

Similar to that of the mainland United States, Puerto Rico's health care system is funded by multiple sources, primarily a combination of private health insurance and public dollars from federal and state/territorial sources, described in further detail later. The health care system in Puerto

Rico has changed significantly in the last 20 years. In 1993, Puerto Rico created La Reforma (The Reform), under the direction of Governor (and former physician) Pedro Rosselló. Before that, the commonwealth had relied heavily on the direct provision of health care by government-owned public regional and district hospitals, as well as municipal clinics. In part inspired by President Bill Clinton's health plan, Rosselló implemented reforms aimed at converting the commonwealth's governmental role from that of directly providing health care to instead serving primarily as a health insurer.[6] One of the reform's goals in doing so was to reduce the disparities in access that critics attributed to the public provision of health care. By moving toward a health insurance–based model that utilized privately employed providers, La Reforma was intended to give lower-income beneficiaries access to a broader array of primary and specialty physicians and to increase consumer choice.[7] La Reforma further aimed to decrease bureaucracy and to control costs by introducing managed care organizations administering both public and private plans.[8]

The reform was initially projected to cost between $860 million and $1.3 billion per year. But costs quickly topped $1.4 billion per year, and by the early 2000s, the government's deficit was increasing.[9] In 2011, La Reforma was expanded, amended, and renamed Mi Salud (My Health). Mi Salud is now the umbrella for the commonwealth's Medicaid, Children's Health Insurance Program (CHIP), and Medicare, and it also covers all the territory's government employees in the program.[10,11] According to 2012 statistics, overall per capita health care spending in Puerto Rico (approximately $3,200) is just over one-third that of the mainland United States ($8,900).[12,13]

Next we briefly highlight some of the key policy differences in the current insurance systems in Puerto Rico and the mainland United States.

Medicaid

Although Medicaid plays a large role in Puerto Rico's health care system, it differs in several important ways from the program in the mainland United States. Generally, states receive matching federal funds to cover between 50% and 83% of their Medicaid costs, depending on the state's federal matching assistance percentage (FMAP), a formula based on each

state's per capita income. Subject to the program's broad federal guidelines, states are able to spend as much as they see fit on Medicaid and receive their open-ended federal match.[14] Similarly, from the beneficiaries' vantage point, Medicaid is an "entitlement program": if they meet the program's eligibility criteria, they are guaranteed the right to enroll in the program, and their expenditures are not capped.

In Puerto Rico and other US territories, however, the funding arrangement for Medicaid is quite different. Despite Puerto Rico's high level of poverty, the territorial FMAP was set at 50% for most of the program's history, and more important, Congress caps the amount of spending eligible for federal reimbursement, meaning that Puerto Rico's Medicaid program operates essentially as a block grant and not as an entitlement program.[15] Congress determines the annual federal spending caps for the territories, which generally have been far below total Medicaid spending, meaning that the federal government's actual contribution to the territories' Medicaid programs—the true match rate—was far below 50% before the advent of the ACA. One estimate from 2005 is that the actual share of Puerto Rico's Medicaid costs reimbursed by the federal government was just 18%.[15-17] In addition, Puerto Rico and the other territories are not eligible under current law to receive Medicaid Disproportionate Share Hospital (DSH) subsidies, another important policy choice by Congress that limits the resources available in Puerto Rico's health care safety net.

Despite these federal funding constraints, Puerto Rico has aggressively offered coverage to its low-income population using Medicaid, far beyond what many mainland US states had done before the ACA. Medicaid eligibility in Puerto Rico relies on a different income measure—the commonwealth poverty level (which is roughly half the federal poverty level, or FPL)—and before the ACA, the territory offered coverage to those with incomes up to 100% of the commonwealth poverty level. Further broadening the program's reach, compared with most states in the mainland United States, Puerto Rico's Medicaid was available to nondisabled low-income adults without children (subject to citizenship requirements)—the so-called childless adults targeted by the ACA's Medicaid expansion.[14] As we discuss later, the ACA did not offer territories the same funding for the Medicaid expansion that is available to states. Nonetheless, since the ACA was passed, Puerto Rico has expanded its Medicaid coverage up to 133% of the commonwealth poverty level, which corresponds roughly to 65% to 75% of the FPL.

Medicare

Unlike Medicaid, Medicare operates fairly similarly in Puerto Rico and the mainland, though it relies much more on Medicare Advantage plans in Puerto Rico, which represented nearly 70% of its enrollment as of 2012.[18] There is no funding cap, and beneficiaries are generally eligible for the same coverage as those receiving Medicare in the states. In addition, Puerto Rico does receive Medicare DSH payments, and starting in fiscal year 2014, these payments to the commonwealth were increased substantially.[19] There are, however, some differences between Medicare in the mainland United States and Puerto Rico. The low-income subsidy for Part D drug coverage is not an entitlement and instead operates as a territory-run block grant. Also, unlike in the mainland United States, enrollment in Medicare Part B is *not* an opt-out program in which most individuals default into coverage at the time they enroll in Part A. Instead, Puerto Rican residents must actively sign up for Part B, and many do not do so. Not signing up at the time of initial eligibility subjects individuals to fines if they enroll in Part B at a later date, and as a result, elderly Puerto Rican residents currently incur over $7 million per year in late enrollment penalties.[20]

The Affordable Care Act

Puerto Rico was largely excluded from the ACA's provisions. While some provisions treat Puerto Rico as a state, others treat it as a separate territory with its own authority. For instance, the individual mandate, the employer mandate, premium tax credits for purchasing private coverage in health insurance marketplaces, and entitlement funding of the Medicaid expansion up to 133% of the FPL do not apply to Puerto Rico. Furthermore, residents of Puerto Rico are not able to use the federal marketplace to purchase coverage, even without subsidies. The combination of the ACA's new insurance requirements without the availability of subsidies led to concerns that the law would destabilize insurance markets in the territories. In response, the Centers for Medicare and Medicaid Services (CMS) clarified in July 2014 that territitories are exempt from most of the insurance requirements outlined in the ACA, including guaranteed issue, prohibition on lifetime and annual limits, coverage of preventive health services, community rating, and essential health benefits.[21] Although these provisions were

designed to increase access to health insurance under the ACA, they may be economically infeasible to implement without the federal tax credits to support a broad risk pool in the insurance market, which was CMS's rationale for exempting the territories from the requirements. Nonetheless, according to Jorge Mas, director of Administración de Seguros de Salud (communication, July 2014), for the time being, Puerto Rico has decided to honor these original policy requirements to the best of its abilities, despite limited funding and the lack of premium tax credits.

There have been other notable changes in the commonwealth as part of the ACA. First, the cap for federal Medicaid funds to the territory was dramatically increased, rising from $260 million in 2008 to roughly $1 billion per year from 2012 to 2019[15,22]; funding after 2019 has yet to be determined. In addition, in July 2011, the Medicaid FMAP was raised from 50% to 55% for all US territories, and the territories also were given the option of implementing their own marketplaces. Although Puerto Rican residents are not eligible for federal tax credits for marketplace coverage, Puerto Rico did receive a one-time grant of $925 million that it plans to use to establish a local marketplace with partial subsidies available to households earning up to $25,000 per year.[10,22,23]

Previous Research and Study Objectives

Despite Puerto Rico being home to millions of mainland US citizens and facing a host of distinctive policy challenges, including providing care in a lower-resource setting than that of any of the 50 states, it has not received much attention in health services research. While some targeted studies have analyzed aspects of Puerto Rico's Reforma of 1993,[24-26] the research literature offers little information on the current state of access to care in Puerto Rico and how these outcomes compare with those of the mainland United States as a whole. One recent study that compared the experiences of Medicare beneficiaries in Puerto Rico with those of the mainland United States found that Puerto Ricans had worse experiences getting needed care and getting care quickly but better doctor-patient communication and customer service.[27] Given the nearly universal coverage rates for the elderly in both

settings, though, these results provide little insight into the experiences of the population as a whole and of uninsured working-age adults in particular.

In the context of significant uncertainty about how Puerto Rico will be able to finance its health care system and the ongoing coverage expansions under the ACA occurring in states with various economic, political, and demographic circumstances, understanding what is and what is not working well in Puerto Rico's health care system could provide valuable insights. The objective of our empirical analysis is to use recent national survey data to provide a snapshot of insurance coverage, access to care, and several measures of health in Puerto Rico compared with the mainland United States.

Methods

Data Source

The primary source for our analysis was the 2011-2012 Behavioral Risk Factor Surveillance System (BRFSS), a telephone survey conducted by the Centers for Disease Control and Prevention (CDC). The BRFSS is an annual household survey of adults 18 and older, conducted in all 50 states, the District of Columbia, and participating US territories. Starting in 2011, the survey includes both landline and cell-phone-only users. The survey is available in multiple languages, and more than 98% of respondents in Puerto Rico completed the survey in Spanish.[28] Domains covered by the survey included demographics, income, whether a person had any health insurance, and several measures related to health care use and health status. The overall response rates for the BRFSS in 2012 were 58% in Puerto Rico, compared with the US median of 45%.[29]

We supplemented these primary analyses with 2012 data from the US Census Bureau's American Community Survey (ACS) and the Puerto Rico Community Survey, which provide more detailed information than does the BRFSS on different types of insurance coverage.

Outcomes

Our coverage outcomes were the percentage of adults with any health insurance and the proportions reporting each type of health insurance (Medicaid, Medicare, private coverage, and other insurance). We

examined several general measures of health care access, including having a personal doctor, delaying care in the prior year "because of cost," and having had a general checkup in the prior year, all of which were identified by a recent US Department of Health and Human Services expert panel as metrics highly relevant to state-level access to care.[30] We looked at access to several specific recommended preventive services: mammogram in the past 2 years for women aged 40 to 75, Pap smears in the past 3 years for women aged 21 to 65, colorectal screening (either fecal occult blood testing or colonoscopy/sigmoidoscopy) for men and women aged 50 to 75, and glucose screening for diabetes for adults older than 45 and for obese adults of any age.[31-34] We also considered several measures of health: self-reported health status on a 5-point scale, body-mass index, smoking status, and reported history of depression.

Statistical Analysis

We first conducted descriptive unadjusted comparisons between Puerto Rico and the mainland United States for each measure. We then estimated multivariate regression models for each outcome, with the covariate of interest a binary indicator for Puerto Rico, and adjusted for population features that may generate significant differences in the health-related measures we were examining. These features included age (in years, plus an indicator variable for those older than 65), sex, household income, educational attainment, urban versus rural residence, marital status, and employment. For race and ethnicity, we used 2 different approaches, to account for the fact that nearly the entire sample in Puerto Rico is of Latino ethnicity. Our primary model adjusted directly for Latino ethnicity separately from race. In sensitivity analyses, we analyzed only those people reporting Latino ethnicity (comparing Latinos in Puerto Rico with Latinos in the mainland United States). Unless noted, the results were similar across both models.

All the study outcomes were binary, and the analyses used logistic regression models. For ease of interpretation, we then converted the adjusted results into predicted probabilities.

Our primary analyses compared the entire Puerto Rican population with the mainland US population. Our secondary analyses of access to care also examined the subset of adults without health insurance. All analyses were conducted in Stata 12.0, using the BRFSS and/or ACS survey weights and accounting for the survey design.

Table 1. Descriptive Statistics for the Study Sample ($n = 980{,}095$)[a]

Variable	Puerto Rico (%, or mean)	United States (%, or mean)	*P*-Value[b]
Male	46.9%	48.7%	0.001
Age, years	45.6	46.4	< 0.001
Elderly (> 65 years), %	17.8%	17.9%	0.70
Race			
White	54.1%	74.6%	< 0.001
Black	6.4%	12.1%	< 0.001
Asian	0.1%	4.7%	< 0.001
Native American	0.2%	1.7%	< 0.001
Other	39.3%	6.9%	< 0.001
Latino ethnicity	98.9%	14.6%	< 0.001
Education			
Less than high school	30.0%	15.0%	< 0.001
High school diploma	25.8%	28.9%	< 0.001
Some college	44.0%	55.7%	< 0.001
Rural	0%	13.8%	< 0.001
Married	39.7%	50.0%	< 0.001
Working	40.1%	55.2%	< 0.001
Household income, annual			
Less than $15,000	40.4%	11.4%	< 0.001
$15,000 to $24,999	23.5%	15.9%	< 0.001
$25,000 to $34,999	7.6%	9.7%	< 0.001
$35,000 to $49,999	5.7%	12.1%	< 0.001
$50,000 or more	5.3%	37.2%	< 0.001
Don't know or refused	17.5%	13.6%	< 0.001

[a]Estimates are for all adults aged 18 and older in the 2011-2012 Behavioral Risk Factor Surveillance System.
[b]*P*-values represent between-group differences (unadjusted) for Puerto Rico versus the United States.

Results

Table 1 presents the summary statistics for the sample, showing that 98.9% of Puerto Ricans in the sample were of Latino ethnicity versus 14.6% of mainland US residents and that a greater share of Puerto

Rico's population was female. Puerto Ricans were less likely to have completed high school or to be employed, and they had significantly lower household incomes.

Table 2, based on the ACS and Puerto Rico Community Survey data, shows the distribution of insurance coverage. The uninsured rate in Puerto Rico was significantly lower than that in the mainland United States, with only 7.4% being uninsured versus 15.0% for the mainland United States ($p < 0.001$). After adjusting for economic and demographic factors, these differences were even larger, with a 12.0 percentage-point lower likelihood of being uninsured for adults in Puerto Rico than for similar individuals in the mainland United States ($p < 0.001$). Table 2 also shows that the payer mix in Puerto Rico relied much more on Medicaid, with 45.9% of residents reporting having Medicaid, compared with just 18.0% in the mainland United States ($p < 0.001$). Conversely, private coverage was significantly less common in Puerto Rico compared with the mainland United States in unadjusted analysis (40.8% versus 64.7%, $p < 0.001$), although after adjustment, private coverage rates were actually higher in Puerto Rico than in the mainland United States (+4.8 percentage points, $p < 0.001$).

Table 3 describes several measures of access to care. Puerto Rico's population as a whole had significantly better access to care for all outcomes, after economic and demographic adjustment. Puerto Rican adults had a 12.8 percentage-point higher likelihood of having a usual source of care than did those in the mainland United States ($p < 0.001$), and a 13.1 percentage-point higher likelihood of having had a checkup in the past year ($p < 0.001$). They had a 7.6 percentage-point lower likelihood of cost-related delays in care ($p < 0.001$). Even uninsured adults in Puerto Rico were more likely to have a usual source of care and to have had a checkup in the prior year in multivariate analyses, and they were less likely to have delayed medical care because of cost than were uninsured adults in the mainland United States.

Table 4 shows several recommended health screening measures. For 2 of these tests—mammography and blood sugar screening—both unadjusted and adjusted rates were significantly higher among Puerto Ricans (adjusted differences +5.8 and +15.5 percentage points, respectively, both $p < 0.001$). Pap smear rates in the mainland United States and Puerto Rico were similar ($p = 0.72$). The adjusted rates of colonoscopy were lower in Puerto Rico than in the mainland United States (−7.9 percentage points, $p < 0.001$); fecal occult blood testing rates were higher

Table 2. Insurance Coverage for Adults in Puerto Rico Versus the United States[a]

	Unadjusted			Adjusted[b]			
Outcome	Puerto Rico (%)	United States (%)	*P*-Value	Odds Ratio	95% Confidence Interval	*P*-Value	Predicted Difference, PR-US (Percentage Points)
Uninsured	7.4	15.0	< 0.001	0.15	(0.15, 0.16)	< 0.001	−12.0
Medicaid	45.9	18.0	< 0.001	2.31	(2.23, 2.38)	< 0.001	+9.9
Medicare	19.5	15.7	< 0.001	1.93	(1.78, 2.09)	< 0.001	+1.9
Private health insurance	40.8	64.7	< 0.001	1.39	(1.35, 1.44)	< 0.001	+4.8
VA/military health care	1.5	2.2	< 0.001	1.12	(1.01, 1.24)	0.03	+0.2

Abbreviations: PR, Puerto Rico; US, United States.

[a]Estimates are for all adults aged 18 and older in the 2012 American Community Survey ($n = 2{,}441{,}532$) and Puerto Rico Community Survey ($n = 26{,}371$).

[b]Adjusted estimates are from a multivariate regression model controlling for age (in years, plus an indicator variable for those over 65 years), sex, household income (as a percentage of the FPL in 4 categories: < 50%, 50%-100%, 100%-200%, > 200%), educational attainment, urban versus rural residence, marital status, and employment.

Table 3. Access to Care for Adults in Puerto Rico Versus the United States[a]

	Unadjusted			Adjusted[b]			
Outcome	Puerto Rico (%)	United States (%)	*P*-Value	Odds Ratio	95% Confidence Interval	*P*-Value	Predicted Difference, PR-US (Percentage Points)
All Adults							
Any health insurance	91.0	81.2	< 0.001	8.28	(7.55, 9.07)	< 0.001	+15.5
Checkup in past year	76.7	67.3	< 0.001	2.09	(1.96, 2.22)	< 0.001	+13.1
Usual source of care	82.7	77.9	< 0.001	3.20	(2.98, 3.44)	< 0.001	+12.8
No delays in care due to cost	82.9	83.3	0.45	2.13	(1.98, 2.28)	< 0.001	+7.6
Uninsured Adults							
Checkup in past year	48.7	39.6	< 0.001	1.46	(1.23, 1.74)	< 0.001	+8.9
Usual source of care	35.9	41.6	0.003	1.41	(1.17, 1.69)	< 0.001	+7.7
No delays in care due to cost	62.0	53.9	< 0.001	1.40	(1.18, 1.67)	< 0.001	+7.8

Abbreviations: PR, Puerto Rico; US, United States.

[a]Estimates are for adults aged 18 and older in the 2011-2012 Behavioral Risk Factor Surveillance System. Sample excludes item nonresponse for each particular outcome.

[b]Adjusted estimates are from a multivariate regression model controlling for age (in years, plus an indicator variable for those over 65 years), sex, household income, educational attainment, urban versus rural residence, marital status, and employment.

Table 4. Preventive Health Services for Adults in Puerto Rico Versus the United States[a]

	Unadjusted			Adjusted[b]			
Outcome	Puerto Rico (%)	United States (%)	*P*-Value	Odds Ratio	95% Confidence Interval	*P*-Value	Predicted Difference, PR-US (Percentage Points)
Colonoscopy (adults 50-75)	44.2	65.8	< 0.001	0.68	(0.60, 0.77)	< 0.001	−7.9
Fecal occult blood testing (adults 50-75)	33.4	33.9	0.65	1.58	(1.37, 1.81)	< 0.001	+10.0
Ever any colon cancer screening (adults 50-75)	59.4	72.5	< 0.001	0.95	(0.83, 1.08)	0.42	−1.0
Mammogram in past 2 years (women 40-75)	84.6	81.4	0.001	1.58	(1.31, 1.91)	< 0.001	+5.8
Pap smear in past 3 years (women 21-65)	85.5	85.4	0.90	0.97	(0.80, 1.17)	0.72	−0.4
Blood sugar in past 3 years (at-risk patients[c])	77.4	63.8	< 0.001	2.22	(1.94, 2.53)	< 0.001	+15.5

Abbreviations: PR, Puerto Rico; US, United States.

[a]Estimates are for adults in the 2011-2012 Behavioral Risk Factor Surveillance System. Sample excludes item nonresponse for each particular outcome.

[b]Adjusted estimates are from a multivariate regression model controlling for age (in years, plus an indicator variable for those over 65 years), sex, household income (as a percentage of the FPL, plus an indicator for those households not reporting any income information), educational attainment, urban versus rural residence, marital status, and employment.

[c]Defined based on US Preventive Services Task Force criteria of obesity (body-mass index ≥ 30, or age ≥ 45).

(+10.0 percentage points, $p < 0.001$); and overall rates of screening did not differ significantly between the 2 locations (−1.0 percentage point, $p = 0.42$).

Table 5 shows several health-related measures from the BRFSS. More than the other variables, the estimates here depended on the particular model. Puerto Ricans were significantly less likely to report excellent or very good health (−2.1 percentage points, $p < 0.001$). Although rates of depression did not differ significantly in our main models, Puerto Ricans had lower rates of depression ($p = 0.001$) in estimates for Latinos only. Puerto Ricans were less likely to be obese in all models (−3.6 percentage points after adjustment, $p < 0.001$). Findings on smoking were mixed. Puerto Ricans were less likely to smoke in unadjusted models and in the adjusted model examining Latinos only ($p = 0.05$). But in the full sample, the difference in smoking was not statistically significant after adjustment ($p = 0.22$).

Discussion

In this cross-sectional comparison of adults in Puerto Rico and the mainland United States, we found that health insurance coverage and basic measures of access to care were significantly better in Puerto Rico than in the rest of the United States, despite the former's much lower per capita income and policy limitations on federal financial support for health care.

The bulk of these differences in coverage and access may be due to the territory's more readily available Medicaid coverage, which accounted for most of the 12.0 percentage-point advantage in uninsured rates (after adjustment) in Puerto Rico compared with those in the mainland United States. Meanwhile, after accounting for socioeconomic status and demographics, private coverage rates in Puerto Rico were quite similar to those in the mainland United States. The pattern of greater access to care correlated with greater Medicaid coverage rates is consistent with earlier research on cross-state variation within the mainland United States, which has shown that low-income individuals in states with more generous Medicaid eligibility have much better access to care.[35,36] But even when limiting the sample to uninsured adults, those living in Puerto Rico reported better access to care than did uninsured adults in the mainland United States, suggesting that these differences in

Table 5. Selected Health Measures for Adults in Puerto Rico Versus the United States[a]

	Unadjusted			Adjusted[b]			
Outcome	Puerto Rico (%)	United States (%)	*P*-Value	Odds Ratio	95% Confidence Interval	*P*-Value	Predicted Difference, PR-US (Percentage Points)
Excellent or very good health	30.1	50.9	< 0.001	0.91	(0.86, 0.96)	0.002	−2.1
Obesity	27.3	27.6	0.67	0.82	(0.78, 0.88)	< 0.001	−3.6
Current smoker	13.7	19.5	< 0.001	0.95	(0.87, 1.03)	0.22	−0.7
Reports history of depression	16.6	16.9	0.46	0.98	(0.91, 1.05)	0.59	−0.3

Abbreviations: PR, Puerto Rico; US, United States.

[a]Estimates are for all adults ages 18 and older in the 2011-2012 Behavioral Risk Factor Surveillance System. Sample excludes item nonresponse for each particular outcome.

[b]Adjusted estimates are from a multivariate regression model controlling for age (in years, plus an indicator variable for those over 65 years), sex, household income (as a percentage of the FPL, plus an indicator for those households not reporting any income information), educational attainment, urban versus rural residence, marital status, and employment.

access were not completely mediated by Puerto Rico's higher coverage rates.

Rates of receiving preventive services were similar or higher in Puerto Rico for 3 of the 4 conditions we measured. More specifically, adherence rates for recommended screening for breast cancer and diabetes were significantly higher in Puerto Rico than in the mainland United States, both before and after adjustment. Meanwhile, recommended cervical cancer screening rates were similar in the mainland United States and Puerto Rico, with both at roughly 85%. Rates of colorectal cancer screening, however, differed significantly by modality: colonoscopy was less common in Puerto Rico, while fecal occult blood testing (FOBT) was more common, with an overall similar percentage of adults receiving any screening. While FOBT remains a recommended option for colorectal screening, it is considered by many to be an inferior test, owing to its lower sensitivity and inability to treat any positive findings without undergoing a diagnostic colonoscopy.[37] Puerto Rico's greater use of FOBT in lieu of colonoscopy may reflect relative resource constraints, since colonoscopy is by far the most expensive of the screening tests we evaluated. The lower rates of colonoscopy may also reflect cultural barriers to the procedure,[38,39] and research has shown that outreach efforts by community health workers or clinical navigators can greatly expand colonoscopy rates, especially among racial and ethnic minorities.[40,41]

Obesity and smoking rates were generally lower in Puerto Rico, although overall self-reported health was slightly worse. The former may relate directly to cultural differences that promote fewer risky health behaviors in Puerto Rico, which is consistent with patterns of assimilation among immigrants to the mainland United States, with first-generation Americans typically adopting less healthy behaviors than their immigrant parents.[39,42] In addition, Puerto Rico's overall economic distress may be partly responsible for worse perceptions of physical health; other cultural differences not captured by simple adjustment for race and ethnicity may also have contributed to these differences in self-reported health.

Overall, our analysis highlights the relatively high rates of coverage, access to care, and preventive health care in Puerto Rico, despite the territory's challenges of higher poverty rates and less federal financial support compared with the mainland states. The notion that Puerto Rico's health system—operating at a fraction of the price—could provide

adequate care in several domains compared with that of the mainland United States may be surprising to many. Although we would need much more clinically detailed information to assess this issue directly, our measures of access and preventive care taken as a whole do not indicate that coverage in Puerto Rico is an empty benefit. In fact, health care in the commonwealth may be preferable in many cases to that received by similarly situated individuals living in the mainland United States. Population-level measures of health also cast doubt on the notion that health care in the commonwealth is demonstrably inferior, as Puerto Rico enjoys nearly a 5% lower age-adjusted mortality rate than does the rest of the mainland United States, and a 26% lower mortality rate than does Mississippi—the state whose per capita income is closest to that of Puerto Rico[43]—though, of course, numerous factors influence life expectancy, of which health care is only one.

Limitations

Our study has several important limitations. First, while we used validated government surveys for our data sources, all our outcomes are self-reported, which means that issues such as recall bias and social desirability bias may have affected them. To the extent that these biases may vary between Puerto Rico and the mainland United States, this could have produced some of the observed differences in our analysis. Demographic factors such as age, gender, and education have been shown to affect the quality of self-reported data, though our estimates did adjust directly for these factors.[44] In addition, response rates were somewhat higher in Puerto Rico than in the mainland United States (58% versus 45%), which also may have affected our results, though the direction of potential bias on our results is unclear. However, the BRFSS's use of population-representative weighting to account for nonresponse has been shown to mitigate potential bias.[45]

Even though we measured several preventive services recommended by national guidelines, our data sources do not allow us to comment on the quality of the health care services rendered or on patients' experiences with their health care, both of which are important questions for future research. Findings from the Consumer Assessment of Healthcare Providers and Systems suggest important differences in these areas among Medicare beneficiaries in Puerto Rico versus those in the

mainland United States, but it is unclear how these patterns may differ for younger adults not in Medicare.[27]

Finally, our analyses are cross-sectional and observational. While the patterns in the data we presented are suggestive regarding relative strengths and limitations in the Puerto Rican health care system, we are unable to attribute any of these outcomes directly to policy decisions made by the territory or by federal policymakers. Numerous unmeasured factors, including cultural norms, economic conditions, available resources, and environmental influences, may have contributed to some of the observed differences among coverage, access, and health measured in our sample. Furthermore, given that the BRFSS did not collect data in Puerto Rico until the late 1990s, we are unable to comment directly on the extent to which Puerto Rico's reform efforts beginning in 1993 produced any changes in the access outcomes studied here. Our analysis is therefore best thought of as descriptive and exploratory, providing a broad overview of how the Puerto Rican health system and the mainland US health system compare on several measures, rather than a policy evaluation of Puerto Rico's reform efforts or congressional policy for the territory, which is beyond the scope of both our article and our data sources.

Policy Implications and Conclusions

Even though Puerto Rico's Medicaid program has a federal match rate far lower than that of other relatively poor states, is subject to a statutory cap, and is excluded from Medicaid DSH payments, Puerto Rico currently enjoys significantly greater levels of coverage and access to care than does the mainland United States as a whole. The pattern of markedly higher Medicaid coverage rates in the commonwealth, associated with much better access to care in a low-income population, suggests that Medicaid eligibility may play a key role in expanding access to care and to recommended preventive services in resource-poor settings. This pattern of findings is consistent with recent studies in Oregon, Massachusetts, and several other states showing significant gains in access to care and recommended preventive services related to the expansion of Medicaid or subsidized state coverage.[46-49]

It is notable that as of May 2015, at least 20 states continue to reject expanding Medicaid under the ACA, in large part due to concerns

about its impact on the state budget,[50] whereas Puerto Rico—with a poverty rate twice as high and federal support for Medicaid far less than what states are eligible for under the ACA—has already committed to covering the bulk of its low-income uninsured population. If Puerto Rico can achieve coverage rates of more than 90% with far fewer resources, it becomes harder to view states' resistance to the ACA expansion as one resulting from economic necessity rather than political and ideological opposition to the law.

Our findings also have important policy implications for Puerto Rico itself. On the measures related to primary care access that we evaluated, Puerto Rico's health system performed very well, although disparities in access to colonoscopy suggest that specialist-delivered services may be an area of greater concern. Specialist shortages may be related to both internal and external factors, such as increasing demand in the mainland United States for bilingual physicians and significantly lower salaries for physicians in Puerto Rico compared with those in the mainland United States, both of which have been linked to increasing migration of physicians away from the commonwealth.[51]

Even though the territory enjoys relatively high levels of coverage and access to care compared with those in the mainland United States, its current budget pressures threaten to erode these accomplishments. Current Medicaid funding for Puerto Rico and the other territories remains far below that received by the states. While the ACA significantly increased Puerto Rico's federal support for Medicaid by lifting its statutory cap nearly 3-fold, the current match rate of 55% is still markedly lower than that received by other low-income parts of the mainland United States. By contrast, Mississippi—with a poverty rate half as high as Puerto Rico—currently receives a 74% federal match rate. Furthermore, Puerto Rico is ineligible for the ACA's 100% match rate to cover childless adults up to 138% of the FPL. Finally, the ACA's increase in the Medicaid cap was guaranteed only through 2019, and without an extension, the expiration of this funding would leave Puerto Rico at risk for returning to its pre-ACA days of less than 20% effective federal support for Medicaid.

Thus, federal policies give priority to spending health care funds on citizens living in the mainland United States over that on US citizens in Puerto Rico. Territorial status currently plays the determining role in Congress's differential treatment of these 2 groups of citizens. In part, this may be justified by the differential tax obligations of Puerto

Rico's residents and those in the mainland United States. Most residents of Puerto Rico (except those employed by the US government) are not subject to the federal income tax, although Puerto Rican residents pay several other federal taxes, including commodity taxes, Social Security and Medicare payroll taxes, and import/export taxes. Exploring a different political status (such as statehood or a modification of current territorial status) could significantly affect federal funding for health care in Puerto Rico, but this approach is far from straightforward. Puerto Rico has had a long internal struggle over its political status, and statehood—even if desired by some of the commonwealth's residents—would require a vote of admission as a state by the US Congress.[52] Thus, for the time being, the territory's political status is likely to lead to continuing funding differences for health care (and other public services) compared with those for the mainland United States.

In conclusion, despite having a far poorer population, Puerto Rico outperforms the mainland United States on several measures of coverage and access. Nonetheless, national policies capping federal support to the territory have contributed to major budgetary challenges. While the Affordable Care Act will significantly increase federal resources in Puerto Rico for the next several years, the territory's health policy efforts are subject to continuing restrictions on Medicaid funding and premium tax credits compared with those for the mainland United States. Future research monitoring these issues will be valuable to informing ongoing federal policy for the commonwealth, and continuing analyses of Puerto Rico's distinctive health care system can shed light on the intersection of federal policies and health care for low-income populations.

References

1. US Census Bureau. Annual estimates of the resident population by single year of age and sex for the United States, States, and Puerto Rico Commonwealth. Washington, DC: US Census Bureau; 2014.
2. Motel S, Patten E. Hispanics of Puerto Rican origin in the United States, 2010-2012. Washington, DC: Pew Research Center; 2012.
3. US Census Bureau. Selected characteristics of people's nativity and citizenship in the past 12 months: American Community Survey 5-year estimates. 2008-2012. Washington, DC: US Census Bureau; 2014.
4. US Census Bureau. Characteristics of people at specified levels of poverty in the past 12 months: American Community Survey

5-year estimates. 2008-2012. Washington, DC: US Census Bureau; 2014.

5. Noss A. Household income for states: 2010 and 2011. Washington, DC: US Census Bureau; 2012.
6. Santos-Lozada AR. Transformations of public healthcare services in Puerto Rico from 1993 until 2010. Paper presented at: Population Association of America annual meeting; April 12, 2013; New Orleans, LA.
7. Health systems profile: Puerto Rico. Washington, DC: Pan American Health Organization; 2007.
8. Organizacion Panamericana de la Salud. Perfil de los sistemas de salud. Washington, DC: Organizacion Panamericana de la Salud, 2007.
9. Hayashi A, Finnegan B, Shin P, Jones E, Rosenbaum S. Examining the experiences of Puerto Rico's community health centers under the government health insurance plan. Washington, DC: George Washington University School of Public Health and Health Services: Geiger Gibson / RCHN Community Health Foundation Research Collaborative; 2009.
10. Maldonado L. Health reform impact for Puerto Rico. Milliman healthcare reform briefing paper. Seattle, WA: Milliman; 2010.
11. Spending and enrollment detail for CBO's August 2010 baseline: Children's Health Insurance Program (CHIP). Washington, DC: Congressional Budget Office; 2010.
12. World Bank. Health expenditure per capita (current US$). Washington, DC: World Bank; 2012.
13. Puerto Rico Chamber of Commerce. Some facts for reference. Puerto Rico Health & Insurance Conference; March 5, 2014; San Juan, PR.
14. Kaiser Family Foundation. Medicaid moving forward. Washington, DC: Kaiser Family Foundation; 2014.
15. US Government Accountability Office. Medicaid and CHIP: opportunities exist to improve US insular area demographic data that could be used to help determine federal funding. Washington, DC: US Government Accountability Office; 2009.
16. US Senate Finance Committee. Governor Anibal Acevedo-Vilá, Commonwealth of Puerto Rico. Hearings on the future of Medicaid: strategies for strengthening America's vital safety net; 2005.
17. US Department of Health and Human Services, Office of Intergovernmental Affairs. Medicaid in the territories—current law and changes proposed in health reform. Washington, DC: US Department of Health and Human Services; 2010.

18. Kaiser Family Foundation. Medicare Advantage (MA) plan penetration. Washington, DC: Kaiser Family Foundation; 2012.
19. Medicare payments to PR hospitals to surge. *Caribbean Business*. August 8, 2013.
20. Pierluisi continues his efforts to improve access to Medicare Part B in Puerto Rico. 2012. http://pierluisi.house.gov/media-center/press-releases/pierluisi-continues-his-efforts-to-improve-access-to-medicare-part-b-in. Accessed July 5, 2014.
21. Tavenner M. Letter to Commissioner Gregory R. Francis. Washington, DC: Centers for Medicare and Medicaid Services; 2014.
22. Diaz-Gines FR. A new economy in health care. Paper presented at: Puerto Rico Health & Insurance Conference; February 3, 2011; Miami, FL.
23. Crescioni XN. Obamacare health plan and its impact on Puerto Rico's health services. *Caribbean Business*. March 18, 2014.
24. Baez-Feliciano DV, Thomas JC, Gomez MA, et al. Changes in the AIDS epidemiologic situation in Puerto Rico following health care reform and the introduction of HAART. *Pan Am J Public Health*. 2005;17:92-101.
25. Chirikos TN, Lopez-Garcia J, Cintron Vargas C, Gonzalez OL, Perez-Grau MP, Baez-Diaz L. Evaluation of breast cancer care under Puerto Rico's health care reform. *JHCPU*. 2007;18:116-138.
26. Alegria M, McGuire T, Vera M, Canino G, Matias L, Calderon J. Changes in access to mental health care among the poor and nonpoor: results from the health care reform in Puerto Rico. *Am J Public Health*. 2001;91:1431-1434.
27. Elliott MN, Haviland A, Dembosky JW, Hambarsoomian K, Weech-Maldonado R. Are there differences in the Medicare experiences of beneficiaries in Puerto Rico compared with those in the US mainland? *Med Care*. 2012;50:243-248.
28. Behavioral Risk Factor Surveillance System. About the Behavioral Risk Factor Surveillance System (BRFSS) 2012. Atlanta, GA: Centers for Disease Control and Prevention; 2013.
29. Behavioral Risk Factor Surveillance System. 2012 summary data quality report. Atlanta, GA: Centers for Disease Control and Prevention; 2013.
30. Davern M. Recommendations for monitoring access to care among Medicaid beneficiaries at the state-level office of the assistance of planning and evaluation. Washington, DC: US Department of Health and Human Services; 2013.
31. US Preventive Services Task Force. Screening for type 2 diabetes mellitus in adults: clinical summary of US Preventive Services Task

Force recommendation. Rockville, MD: US Preventive Services Task Force; June 2008.

32. US Preventive Services Task Force. Screening for colorectal cancer: US Preventive Services Task Force recommendation statement. Rockville, MD: US Preventive Services Task Force; October 2008.
33. US Preventive Services Task Force. Screening for cervical cancer: US Preventive Services Task Force recommendation statement. Rockville, MD: US Preventive Services Task Force; June 2012.
34. US Preventive Services Task Force. Screening for breast cancer: information sheet on the draft research plan. Rockville, MD: US Preventive Services Task Force; 2013.
35. Clark CR, Ommerborn MJ, Coull BA, Pham DQ, Haas J. State Medicaid eligibility and care delayed because of cost. *New Engl J Med*. 2013;368:1263-1265.
36. Weissman JS, Zaslavsky AM, Wolf RE, Ayanian JZ. State Medicaid coverage and access to care for low-income adults. *JHCPU*. 2008;19:307-319.
37. Niv Y, Sperber AD. Sensitivity, specificity, and predictive value of fecal occult blood testing (hemoccult II) for colorectal neoplasia in symptomatic patients: a prospective study with total colonoscopy. *Am J Gastroenterol*. 1995;90:1974-1977.
38. Early DS, Gray DM. Patient attitudes and issues in colon cancer screening. *J Natl Compr Cancer Network*. 2014;12(5):673-678.
39. Afable-Munsuz A, Liang SY, Ponce NA, Walsh JM. Acculturation and colorectal cancer screening among older Latino adults: differential associations by national origin. *J Gen Intern Med*. 2009;24(8):963-970.
40. Percac-Lima S, Grant RW, Green AR, et al. A culturally tailored navigator program for colorectal cancer screening in a community health center: a randomized, controlled trial. *J Gen Intern Med*. 2009;24(2):211-217.
41. Christie JIS, Lihau-Nkanza I. A randomized controlled trial using patient navigation to increase colonoscopy screening among low-income minorities. *J Natl Med Assoc*. 2008;100:278-284.
42. McCarthy WJ, Flores Y, Zheng H, Hanson TL. Immigrant generational status and ethnic differences in health. *Am J Public Health*. 2005;95:1494; author's reply:1495.
43. Murphy SL, Xu J, Kochanek, KD. Deaths: final data for 2010. Washington, DC: US Department of Health and Human Services; 2013.
44. Short ME, Goetzel RZ, Pei X, Tabrizi MJ, Ozminkowski RJ, Gibson TB. How accurate are self-reports? Analysis of self-reported

health care utilization and absence when compared with administrative data. *J Occup Environ Med*. 2009;51:786-796.

45. Pew Research Center. Assessing the representativeness of public opinion surveys. 2012. http://www.people-press.org/2012/05/15/assessing-the-representativeness-of-public-opinion-surveys/. Accessed January 30, 2015.
46. Sommers BD, Baicker K, Epstein AM. Mortality and access to care among adults after state Medicaid expansions. *New Engl J Med*. 2012;367:1025-1034.
47. Sommers BD, Long SK, Baicker K. Changes in mortality after Massachusetts health care reform: a quasi-experimental study. *Ann Intern Med*. 2014;160:585-593.
48. Baicker K, Taubman SL, Allen HL, et al. The Oregon experiment—effects of Medicaid on clinical outcomes. *New Engl J Med*. 2013;368:1713-1722.
49. Van Der Wees PJ, Zaslavsky AM, Ayanian JZ. Improvements in health status after Massachusetts health care reform. *Milbank Q*. 2013;91:663-689.
50. Sommers BD, Epstein AM. US governors and the Medicaid expansion—no quick resolution in sight. *New Engl J Med*. 2013;368:496-499.
51. Coto D. Doctors flee Puerto Rico for US mainland. Associated Press. April 17, 2013.
52. Koebler J. Despite referendum, Puerto Rico statehood unlikely until at least 2015. *U.S. News & World Report.* November 7, 2012.

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